

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/42807

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F16B 21/00, 19/00
 US CL : 411/511, 516, 520, 508, 509, 510, 352, 349, 549, 554, 350

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 411/511, 516, 520, 508, 509, 510, 352, 349, 549, 554, 350

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US-2,969,571 A (Vander Sande et al.) 31 January 1961 (31.01.1961), Entire document.	1-5, 7, 9, 10, 12-17 411/522
X	US-2,936,668 A (Meyer) 17 May 1960 (17.05.1960), Entire document	1-5, 7, 9, 11-15, 17
X	US-2,668,998 A (Tinnerman) 16 February 1954 (16.02.1954), Entire document	1-5, 10-17
X	US-2,798,277 A (Flora) 9 July 1957 (09.07.1957), Entire document	1-7, 9-17
X	US-2,556,988 A (Swanson) 12 June 1951 (12.06.1951), Entire document	1-5, 7, 9-11, 15-17
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Y		6, 8, 13, 14
X	US-5,759,004 (Kuffel) 2 June 1998 (02.06.1998), Entire document	1-7, 9-15, 17
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Y		8
X	US-5,249,900 A (Mitts) 5 October 1993 (05.10.1993), Entire document	1, 2, 13-15, 17

<input checked="" type="checkbox"/>	Further documents are listed in the continuation of Box C.	<input type="checkbox"/>	See patent family annex.
*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
10 May 2005 (10.05.2005)	29 JUN 2005
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Jeffrey Sharp Telephone No. (703) 308-4177

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INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US04/42807**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US-6,438,804 B1 (Romero Magarino) 27 August 2002 (27.08.2002), Entire document	1, 2, 13-15, 17
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Y	Figures 1-10.	5, 6, 11, 12
X	US-5,906,346 A (Lin et al.) 25 May 1999 (25.05.1999), Entire document	1-5, 7, 9, 10, 13-15, 17
X	US-5,632,584 A (Acevedo) 27 May 1997 (27.05.1997), Entire document	1-4, 11-15, 17
Y	US-3,854,173 A (Barnett) 17 December 1974 (17.12.1974), Entire document	1, 2, 15-17
X	US-3,504,875 A (Johnson et al.) 7 April 1970 (07.04.1970), Entire document, Figure 3 element (36)	1-6, 10, 13-17
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Y	US-3,124,993 A (Schlueter) 17 March 1964 (17.03.1964), Figure 7 element (49)	6
Y	US-2,171,925 A (Fitts) 5 September 1939 (05.09.1939), Figure 1 elements (7,8)	6, 7, 9
Y	US-2,151,284 A (Tinnerman) 21 March 1939 (21.03.1939), Figure 1	1-4, 6, 7, 9, 10